ARCADIS

Infrastructure · Water · Environment · Buildings

ARCADIS
8725 Rosehill, Suite 350
Lenexa
Kansas 66215
Tel 913.492.0900
Fax 913.492.0902
www.arcadis-us.com

Mr. Ken Herstowski
Project Manager
Air, RCRA and Toxics Division
United States Environmental Protection Agency
Region 7
901 North 5th Street
Kansas City, Kansas 66101

ENVIRONMENT

Subject:
Summary of Results - Pre-Development Investigation
Heritage Track Project
Union Pacific Railroad – Former Omaha Shops Site
Omaha, Nebraska
RCRA ID# NED000829754

Date:
May 11, 2011

Contact:
John Shonfelt

Phone:
913.492.0900

Email:
john.shonfelt@arcadis-us.com

Our ref:
KC001557.0001

Dear Mr. Herstowski:

This letter presents the results of sampling performed as part of a Pre-Development Investigation for the Union Pacific Railroad (UP) Heritage Track site, located north of Abbott Drive in Omaha, Nebraska. This soil and groundwater characterization was performed as part of the RCRA Corrective Measure Implementation (CMI) at the former UP Shops Facility in Omaha, Nebraska (herein referred to as the Site). All sample collection, laboratory analysis, and evaluation were consistent with the requirements contained in the Site-wide Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) for the Site[1].

BACKGROUND

UP is constructing a spur track and display area for steam locomotives and heritage fleet passenger cars along the north side of Abbott Drive, as shown on Figure 1. This property on which the display spur is located is owned by UPRR and is within the boundary of Operable Unit No. 2 (OU2) of the 9th and Webster Street site, which is commonly referred to as the Former Omaha Shops site. Figure 2 shows the Heritage track project footprint in proximity to the soil monolith and embankment constructed during the Abbott Drive realignment.

---

[1] ARCADIS, 2008. Site-Wide Sampling and Analysis Plan and Site-Wide Quality Assurance Project Plan for Corrective Measures Implementation. Operable Units OU2 and OU3, Union Pacific Railroad, 9th and Webster Streets (Former Omaha Shops Site) Omaha, Nebraska, EPA ID No. NED000829754. ARCADIS, Lenexa, KS. April 22.

Since the Heritage Track Project is being developed within the boundaries of OU2, the provisions of the OU2 CMI Work Plan[2] apply, and a Pre-Development Investigation was conducted to collect and evaluate soil data prior to construction.

The non-intrusive track construction activities, including sub-roadbed preparation, ballast installation, and track laying, are on-going through April and May 2011, with a completion date of early June 2011.

SUMMARY OF WORK PERFORMED

The scope of work for the Pre-Development Investigation was discussed in a letter to EPA dated February 17, 2011. This section presents the results of the investigation.

The Heritage Track spur is being built generally on-grade, but intrusive construction activities were performed at the location of a large City of Omaha storm sewer. The track crosses a 14 ft by 9 ft box storm sewer and nearby 15-inch sanitary sewer just north of 10th Street and Abbott Drive. In order to protect the sewer piping, a pile and slab structure was constructed over the lines. Soil borings were initially drilled, and cap piles installed in the soil borings. Once the four lines of cap piles were in place, three steel-reinforced, horizontal concrete slabs were cast-in-place over the storm and sanitary sewer lines. All soil removed during intrusive construction activities was stockpiled and sampled as further described below.

The Heritage Track project is classified as a non-residential development, with potential exposure scenarios including workers, construction workers, and recreational users. The OU2 CMI Work Plan outlines the investigative requirements prior to conducting non-residential development, and the soil cleanup levels to be maintained during development. The Pre-Development Investigation for the Heritage Track work was consistent with the requirements contained in the OU2 CMI Work Plan. The Heritage Track Pre-Development Investigation included:

- Reviewing previous data collected during the Former Omaha Shops RFI, in the vicinity of the Heritage Track Project
- Collecting shallow (0 to 1 ft below ground surface, bgs) soil samples along the track alignment and in proposed non-paved Heritage Train viewing areas

---

[2] ARCADIS, 2008. Operable Unit No. 2. Corrective Measures Implementation Work Plan. Union Pacific Railroad, 9th and Webster Streets (Former Omaha Shops Site) Omaha, Nebraska, EPA ID No. NED000829754. ARCADIS, Lenexa, KS. April 22.

- Collecting deep (up to 22 ft bgs) soil samples in the areas where storm sewer upgrades were planned
- Collecting groundwater samples in the areas where construction workers may potentially come into contact with groundwater.
- Removal of surface soil containing elevated arsenic samples and collection of confirmation samples following soil disposal.
- Collection of characterization samples from excavated soil accumulated from intrusive activities.

These activities and the results of sampling are discussed below.

REVIEW OF HISTORICAL RFI DATA

Figures 3, 4 and 5 present the results of soil sampling performed during the RFI in the vicinity of the Heritage Track project. The soil quality data summarized in these figures were reviewed and used to guide the Pre-Development Investigation sampling location and constituents to be analyzed. Figure 3 shows that the non-residential soil cleanup goal for lead (1,218 mg/kg) was exceeded in the surface (0-1 ft bgs) location at four locations:

- UPCA-SB15 (east of Izard and 11th Street);
- UPCA-SB14 (now beneath the monolith);
- UPNY-SB07 (north of the monolith and west of 8th Street Yard); and
- UPNY-SB14 (west of the 8th Street Yard and just south of Seward Street)

As part of the historical remediation work at OU1 Corrective Measures, soil from these four boring locations were excavated and placed in the Abbott Drive monolith.

SHALLOW AND SUBSURFACE SAMPLING

In March 2011, surface and subsurface soil samples and groundwater samples were collected according to the standard operating procedures for direct push sampling contained in the Site-Wide SAP prepared for OU2. Samples were analyzed for lead, arsenic, volatile organic chemicals (VOCs) and/or semi-volatile organic chemicals (SVOCs) as appropriate. Figures 6, 7, and 8 present the results of the sampling for lead and arsenic, VOCs/SVOCs, and groundwater VOCs, respectively. The laboratory reports for the Pre-Development sampling are presented in Attachment 1.

Surface soil sampling locations were chosen to obtain data along the proposed track alignment and in proposed non-paved viewing areas to include geographic coverage of the Heritage Track project. Surface samples were collected in the 0 to 1 ft below ground surface (bgs) interval.

All surface samples were be analyzed for lead and arsenic. Additionally, four surface samples (SSB-07, SSB-10, SSB-12, and SSB-14) were analyzed for VOCs, and SVOCs. The sampling locations for the VOC/SVOC analysis were chosen to correspond to areas where those groups of constituents were detected during the RFI, as summarized in Figures 3, 4, and 5.

Subsurface soil and groundwater samples were collected at areas where construction workers could potentially be exposed to impacted subsurface soils, specifically:

- In the vicinity where the existing 9 ft x 14 ft box storm sewer line crosses the proposed track alignment, located north of the Abbott Drive/10th Street intersections. Two soil borings (DSB-01 and DSB-02) were installed at the box storm sewer. Soil samples were collected at the following depth from each of the soil borings:
  - 6 ft bgs;
  - 10 ft bgs;
  - 18 ft bgs (two feet below the invert elevation of the box storm sewer)

The subsurface box storm sewer samples were analyzed for lead, arsenic, VOCs, and SVOCs. Results for lead and arsenic are presented on Figure 6. VOC and SVOC results are presented on Figure 7. No groundwater was encountered at 18 ft bgs during sampling at the box culvert location.

Although not part of the Heritage Track project, a triple storm sewer line is scheduled to be extended through the site by the City of Omaha in 2012. In anticipation of this construction, three soil borings (DSB-3, DSB-4, and DSB-5) were installed along the proposed triple storm sewer corridor. At these locations, samples were collected at the 6 ft, 10 ft, and 22 ft bgs intervals. Groundwater was encountered at 22 ft bgs in these locations and thus, groundwater samples were collected.

The triple storm sewer corridor samples were analyzed for lead, arsenic, VOCs, and SVOCs, and the three groundwater samples were analyzed for VOCs. The groundwater sampling results are shown on Figure 8.

SURFACE SOIL REMOVAL AND CONFIRMATION SAMPLING

The results of the Pre-development Investigation sampling indicated that, with the exception of one location (SSB-07, see Figure 6), all samples at all locations were below the non-residential soil cleanup levels, as presented in the USEPA Corrective Measures Decision document[3], and summarized in the OU2 CMI Work Plan.

Arsenic was detected in the 0 to 1 ft bgs sample SSB-07 at a concentration of 1,180 mg/kg, compared to a non-residential soil cleanup level of 440 mg/kg.

Since the arsenic cleanup level was exceeded at SSB-07, the soil at and around SSB-07 was excavated to a depth of 1 ft, and sent to Butler County Landfill under a special waste disposal permit. Approximately 23 cubic yards (a 25 ft by 25 ft square) of soil was excavated from around SSB-07 and disposed.

Following excavation, a composite confirmation sample was collected from the bottom of the excavated area and submitted for lead and arsenic analysis. The results are shown on Figure 6 and indicate that the 1 to 2 ft interval is below the non-residential soil cleanup goals for lead and arsenic. The laboratory reports for the SSB-07 confirmation sampling are presented in Attachment 2.

STOCKPILED SOIL SAMPLING

As part of the intrusive activities at the sewer near Abbott Drive and 10th Street, soil was excavated prior to installing piers to support protective caps over the sewer. The soil that was excavated was field-screened with a PID during excavation and all soil generated from the intrusive activities was stockpiled on-site. Once the intrusive activities were completed, a composite characterization sample was collected of the stockpiled soil and analyzed for lead, arsenic, VOCs and SVOCs. The results of the analysis on the stockpiled soil are presented in Attachment 3 and summarized below:

- Lead 61.6 mg/kg
- Arsenic 12.1 mg/kg
- VOCs none detected – J coded values only

---

[3] USEPA, 2007. Response to Comments and Final Corrective Measures Decision. Corrective Measures for Operable Units Number 2 and 3 and Contingent Restricted Residential Corrective Measures for Operable Units 1, 2 and 3. Union Pacific Railroad 9th and Webster Streets, Omaha, Nebraska. RCRA ID# NED000829754

- SVOCs — Fluoranthene – 0.137 mg/kg
  Phenanthrene – 0.0489 mg/kg,
  Pyrene - 0.122 mg/kg
  other constituents with J coded values

Since the analytical results for the stockpiled soil were well below the non-residential soil cleanup goals, and the lead result was also below the 200 mg/kg level for 'clean fill' as defined in the Corrective Measure Decision document, the stockpiled soil was reused as backfill. A portion of the stockpiled soil was used to bring the SSB-07 excavation back to its original grade, and the remainder used to fill low-lying areas. Both the SSB-07 area and the low-lying areas will be covered with imported clean fill to raise the surface to the final grade designed grade.

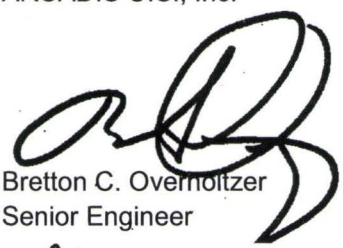
RECOMMENDATIONS AND ADDITIONAL ACTIVITIES

According to the construction plans, all significant intrusive activities have been completed at the site. Shallow excavations for light poles and fence posts will be installed in early May, and ARCADIS will be present to field-screen the excavation activities with a PID. No additional sampling is planned.

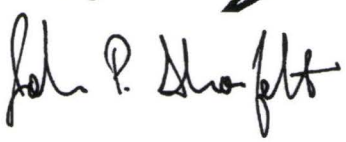
Please call us at 913.492.0900 if you have any questions regarding the enclosed information.

Sincerely,

ARCADIS U.S., Inc.



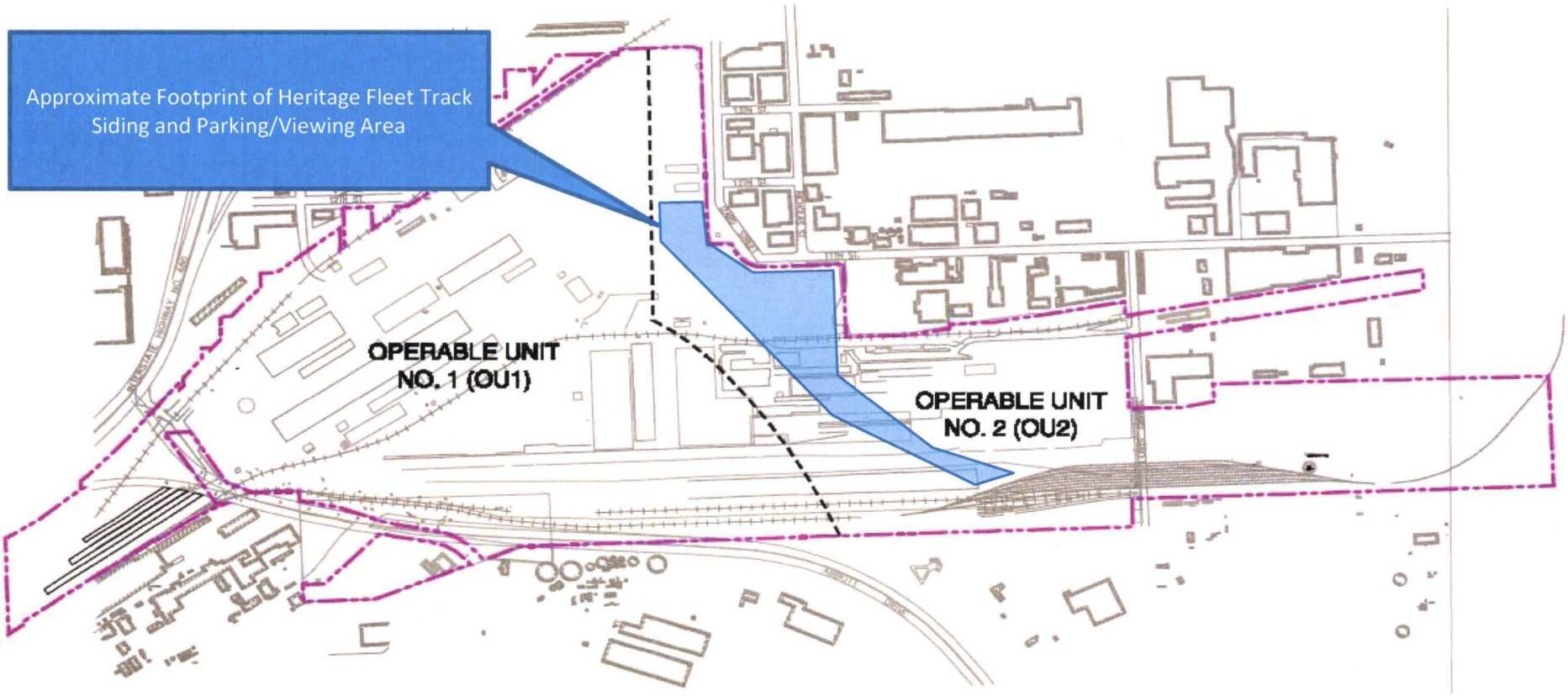
Bretton C. Overholtzer
Senior Engineer



John P. Shonfelt
Senior Project Manager

Copies:

Jeff McDermott (UPRR)
Bill Gidley (NDEQ)
Bob Stubbe (City of Omaha Public Works)
Jeff Smith (URS)



LEGEND

UPRR OMAHA SHOPS PROPERTY LINE

OPERABLE UNIT

800 400 0 800

SCALE IN FEET

Union Pacific Railroad

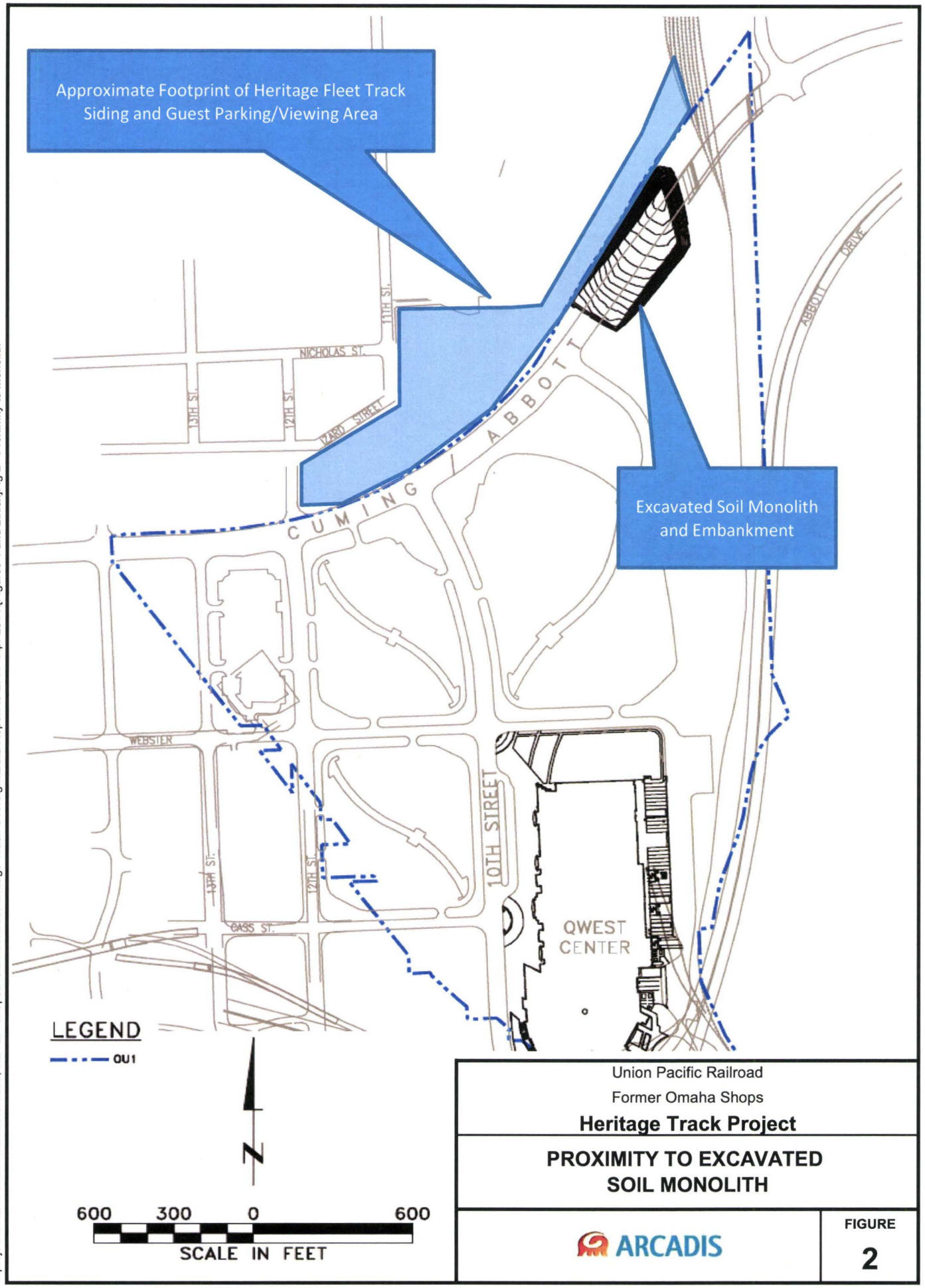
Former Omaha Shops

Heritage Track Project

LOCATION OF HERITAGE FLEET TRACK

ARCADIS

FIGURE 1



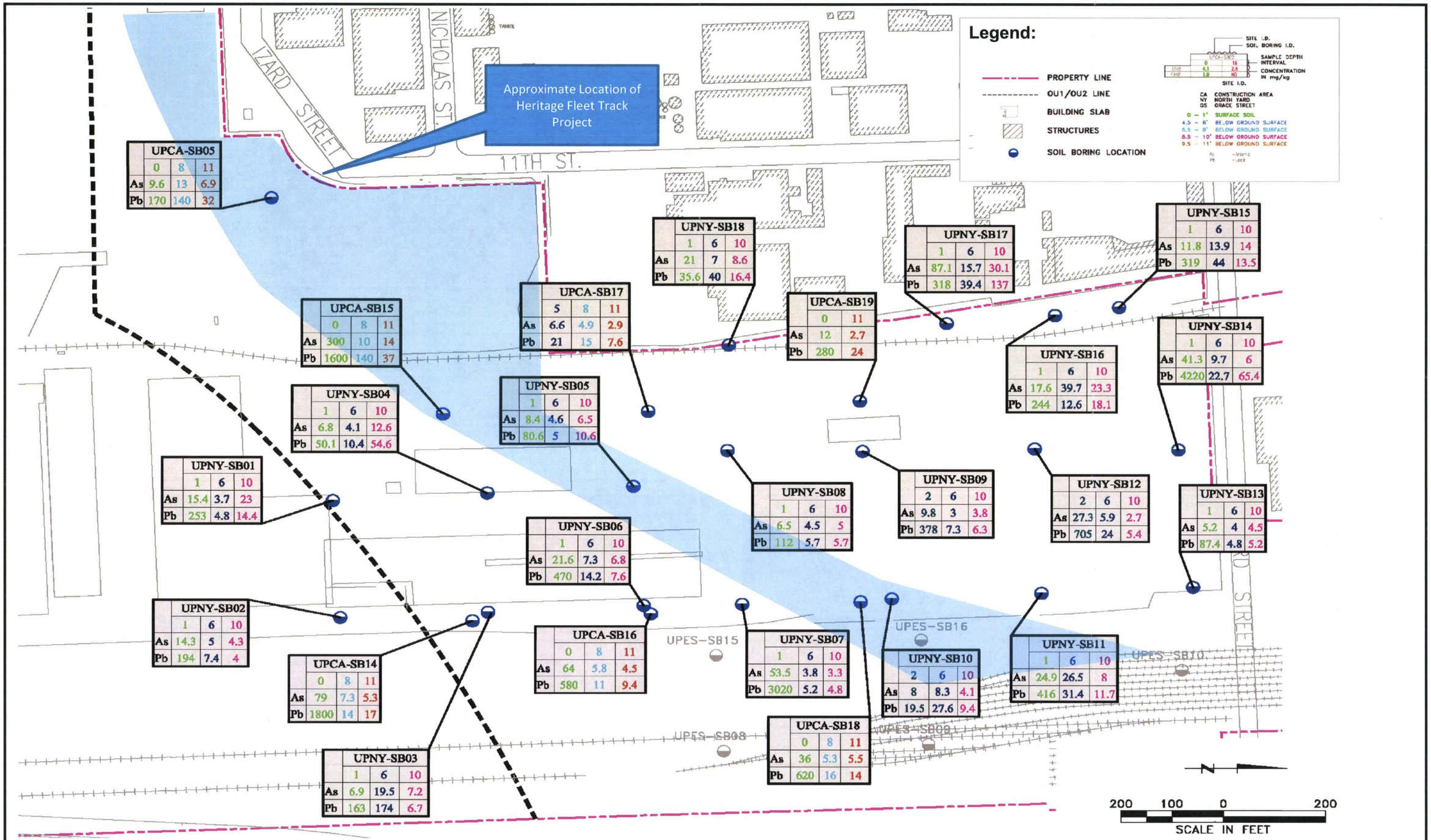
Union Pacific Railroad
Former Omaha Shops
Heritage Track Project

PROXIMITY TO EXCAVATED SOIL MONOLITH

ARCADIS

FIGURE
2

4/22/2011
Aproject\Union Pacific Railroad\Omaha, NE- UP Shops\Field Activities\Heritage Track Oversight\Data Report to EPA - Apr 2011\[Figures 1 and 2.xlsx]Fig 2 - Proximity to Monolith



UPCA-SB05	0	8	11
As	9.6	13	6.9
Pb	170	140	32

UPCA-SB15	0	8	11
As	300	10	14
Pb	1600	140	37

UPCA-SB17	5	8	11
As	6.6	4.9	2.9
Pb	21	15	7.6

UPNY-SB18	1	6	10
As	21	7	8.6
Pb	35.6	40	16.4

UPCA-SB19	0	11
As	12	2.7
Pb	280	24

UPNY-SB17	1	6	10
As	87.1	15.7	30.1
Pb	318	39.4	137

UPNY-SB15	1	6	10
As	11.8	13.9	14
Pb	319	44	13.5

UPNY-SB16	1	6	10
As	17.6	39.7	23.3
Pb	244	12.6	18.1

UPNY-SB14	1	6	10
As	41.3	9.7	6
Pb	4220	22.7	65.4

UPNY-SB04	1	6	10
As	6.8	4.1	12.6
Pb	50.1	10.4	54.6

UPNY-SB05	1	6	10
As	8.4	4.6	6.5
Pb	80.6	5	10.6

UPNY-SB01	1	6	10
As	15.4	3.7	23
Pb	253	4.8	14.4

UPNY-SB08	1	6	10
As	6.5	4.5	5
Pb	112	5.7	5.7

UPNY-SB09	2	6	10
As	9.8	3	3.8
Pb	378	7.3	6.3

UPNY-SB12	2	6	10
As	27.3	5.9	2.7
Pb	705	24	5.4

UPNY-SB13	1	6	10
As	5.2	4	4.5
Pb	87.4	4.8	5.2

UPNY-SB06	1	6	10
As	21.6	7.3	6.8
Pb	470	14.2	7.6

UPNY-SB02	1	6	10
As	14.3	5	4.3
Pb	194	7.4	4

UPCA-SB16	0	8	11
As	64	5.8	4.5
Pb	580	11	9.4

UPNY-SB07	1	6	10
As	53.5	3.8	3.3
Pb	3020	5.2	4.8

UPNY-SB10	2	6	10
As	8	8.3	4.1
Pb	19.5	27.6	9.4

UPNY-SB11	1	6	10
As	24.9	26.5	8
Pb	416	31.4	11.7

UPCA-SB14	0	8	11
As	79	7.3	5.3
Pb	1800	14	17

UPCA-SB18	0	8	11
As	36	5.3	5.5
Pb	620	16	14

UPNY-SB03	1	6	10
As	6.9	19.5	7.2
Pb	163	174	6.7

Project Manager: John Shonfelt
Drawn by: BCO
Date: April 21, 2011

ARCADIS
8725 Rosehill, Suite 350
Lenexa, Kansas 66215
Tel: 913.492.0900
Fax: 913.492.0902

OU2 Soil Concentrations - Arsenic and Lead

Former Omaha Shops
Omaha, Nebraska

Figure
3

G:\Aproject\Union Pacific Railroad\Omaha, NE- UP Shops\Field Activities\Heritage Track Oversight\Data Report to EPA - Apr 2011\Heritage Track - Lead and Arsenic VOCs SVOCs in Soil.xlsx

Approximate Location of Heritage Fleet Track Project

YARD STREET

11TH ST.

ABBOTT

UPNY-SB17	1	6	10
TOL	ND	3.6	ND

UPNY-SB16	1	6	10
TOL	ND	ND	3.2
1,2,4-TMB	ND	16	ND
1,3,5-TMB	ND	6.8	ND
XYL	ND	27.9	ND

UPNY-SB09	2	6	10
n-PBENZ	3.2	ND	ND
TOL	11.9	3.6	ND
1,2,4-TMB	18	ND	ND
1,3,5-TMB	5.5	ND	ND
XYL	18.9	ND	ND

UPNY-SB15	1	6	10
TOL	47.2	4.6	5.9

UPCA-SB05	0	8	11	16
MECL	NA	ND	3	ND

UPNY-SB18	1	6	10
TOL	ND	ND	18.8

UPNY-SB08	1	6	10
TOL	10.9	2.3	ND

UPNY-SB12	2	6	10
TOL	132J	ND	6.7

UPNY-SB05	1	6	10
PCE	ND	22.7	4.2

UPNY-SB03	1	6	10
TOL	ND	12.3	ND

UPNY-SB14	1	6	10
CFRM	2.4	2.6	ND
TOL	16	4.5	ND

UPNY-SB01	1	6	10
cis-1,2-DCE	ND	ND	ND
PCE	86.9	ND	ND
TOL	61.9	ND	18.3

UPCA-SB15

UPCA-SB17

UPCA-SB19

UPNY-SB11

UPNY-SB06

UPNY-SB07

UPNY-SB03

UPES-SB16

UPES-SB15

UPES-SB10

UPES-SB08

UPES-SB09

UPNY-SB02	1	6	10
PCE	3	ND	ND
TOL	ND	7	ND

UPCA-SB18	0	8	11
MECL	NA	15	15

UPCA-SB14	0	8	11
MECL	NA	3J	2
TOL	NA	2J	ND

UPNY-SB13	1	6	10
PCE	38.5	ND	24.4
TOL	5.1	ND	3.7

UPCA-SB16	0	8	11
MECL	NA	3J	14

UPNY-SB10	2	6	10
n-PBENZ	ND	2.6	ND
TOL	ND	3.6	1.9
1,2,4-TMB	ND	12.9	ND
1,3,5-TMB	ND	5	ND
XYL	ND	3.2	ND

N

200 100 0 200

SCALE IN FEET

Legend:

- PROPERTY LINE
- OU1/OU2 LINE
- BUILDING SLAB
- STRUCTURES
- SOIL BORING LOCATION

UPCA-SB02	0	16
DNB	4.1	2.6
FANT	1.9	ND

SITE I.D.
SOIL BORING I.D.
SAMPLE DEPTH INTERVAL
CONCENTRATION IN µg/kg
SITE I.D.

CA CONSTRUCTION AREA
NY NORTH YARD
GS GRACE STREET

0 – 1' SURFACE SOIL
4.5 – 6' BELOW GROUND SURFACE
6.5 – 8' BELOW GROUND SURFACE
8.5 – 10' BELOW GROUND SURFACE
9.5 – 11' BELOW GROUND SURFACE
14.5 – 16' BELOW GROUND SURFACE

1,4-DCB –1,4-Dichlorobenzene
1,3,5-TMB –1,3,5-Trimethylbenzene
BENZ –Benzene
cis-1,2-DCE –cis-1,2-Dichloroethene
CBENZ –Chlorobenzene
CFRM –Chloroform
1,1-DCE –Dichloroethene
MECL –Methylene chloride
n-BBENZ –n-Butylbenzene
n-PBENZ –n-Propylbenzene
PCA –1,1,1,2-Tetrachloroethane
PCE –Tetrochloroethene
1,2,4-TMB –1,2,4-Trimethylbenzene
TOL –Toluene
trans-1,2-DCE –trans-1,2-Dichloroethene
TCE –Trichloroethene
XYL –Xylenes, Total
VC –Vinyl Chloride

ND – non-detect
NA – not analyzed

Project Manager: John Shonfelt
Drawn by: BCO
Date: April 21, 2011

ARCADIS
8725 Rosehill, Suite 350
Lenexa, Kansas 66215
Tel: 913.492.0900
Fax: 913.492.0902

OU2 Soil Concentrations - VOCs

Former Omaha Shops
Omaha, Nebraska

Figure 4

G:\Aproject\Union Pacific Railroad\Omaha, NE- UP Shops\Field Activities\Heritage Track Oversight\Data Report to EPA - Apr 2011\Heritage Track - Lead and Arsenic VOCs SVOCs in Soil.xlsx

	UPCA-SB05			
	0	8	11	16
CHR	1	ND	ND	ND
FANT	2.3	ND	ND	ND
PHEN	1.7	ND	ND	ND
PYR	2.1	ND	ND	ND

	UPCA-SB15		
	0	8	11
ANT	ND	1	ND
BENZA	5.2	1.6	ND
BENZP	5.3	1.3	ND
BENBF	5.7	ND	ND
BENGHIP	4.5	ND	ND
BENKF	4.6	ND	ND
CHR	5.3	1.3	ND
FANT	8.5	3.2	ND
PHEN	7.3	3	ND
PYR	9.9	3	ND
NAP	2.2	ND	ND
ICDP	4	ND	ND

	UPCA-SB19	
	0	11
FANT	1.2	ND

121H ST.

STREET

ARD STREET

UPNY-SB18 UPNY-SB17 UPNY-SB16 UPNY-SB15

UPCA-SB17

UPNY-SB12 UPNY-SB14

UPNY-SB01 UPNY-SB04 UPNY-SB05 UPNY-SB08 UPNY-SB09

Approximate Location of Heritage Fleet Track Project

UPNY-SB11 UPNY-SB13

UPNY-SB02 UPNY-SB03 UPNY-SB06 UPNY-SB07 UPCA-SB18 UPNY-SB10

UPCA-SB14 UPCA-SB16 UPES-SB16

UPES-SB15 UPES-SB10

UPES-SB08 UPES-SB09

Legend:

- PROPERTY LINE
- OU1/OU2 LINE
- BUILDING SLAB
- STRUCTURES
- SOIL BORING LOCATION

SITE I.D.
SOIL BORING I.D.

	UPCA-SB02	
	0	16
DNB	4.1	2.6
FANT	1.9	ND

SITE I.D.

SAMPLE DEPTH INTERVAL

CONCENTRATION IN µg/g

CA CONSTRUCTION AREA
NY NORTH YARD
GS GRACE STREET

0 – 1' SURFACE SOIL
6.5 – 8' BELOW GROUND SURFACE
9.5 – 11' BELOW GROUND SURFACE
14.5 – 16' BELOW GROUND SURFACE

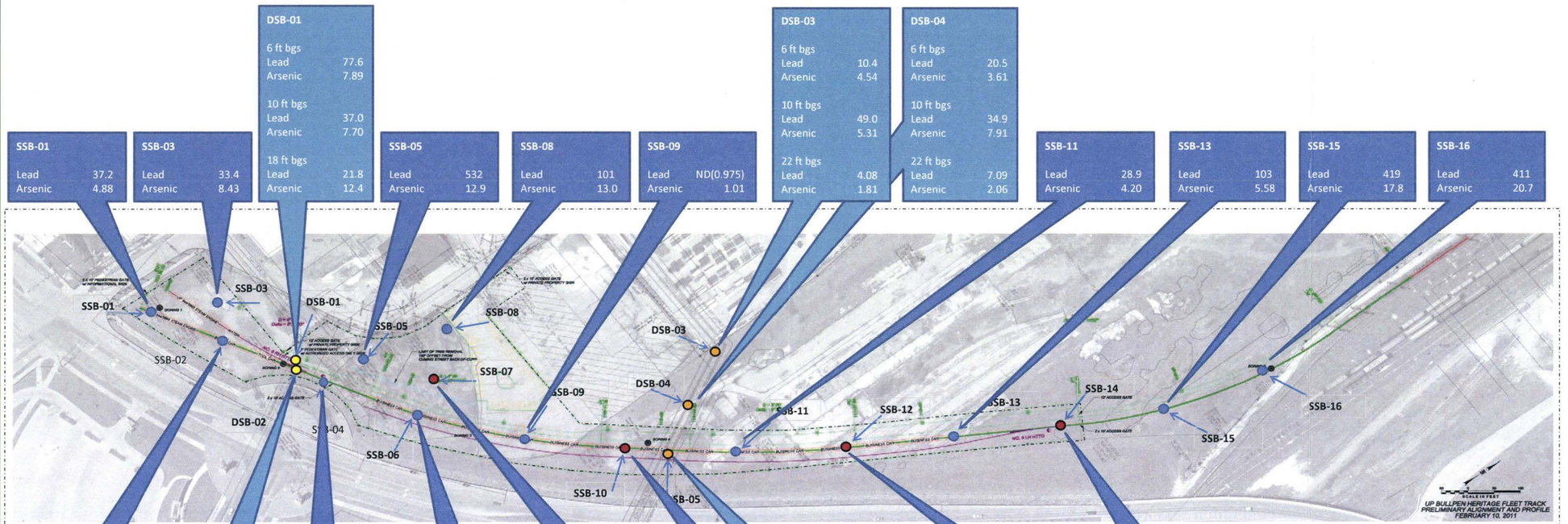
ANT – Anthracene
BENZA – Benzo(a)anthracene
BENZP – Benzo(a)pyrene
BENBF – Benzo(b)fluoranthene
BENKF – Benzo(k)fluoranthene
CHR – Chrysene
FANT – Fluoranthene
NAP – Naphthalene
PHEN – Phenanthrene
PYR – Pyrene
BENGHIP – Benzo(ghi)perylene
ICDP – Indeno(1,2,3-cd)pyrene

ND – non-detect

200 100 0 200
SCALE IN FEET

Project Manager: John Shonfelt Drawn by: BCO Date: April 21, 2011	ARCADIS 8725 Rosehill, Suite 350 Lenexa, Kansas 66215 Tel: 913.492.0900 Fax: 913.492.0902	**OU2 Soil Concentrations - SVOCs** **Former Omaha Shops** **Omaha, Nebraska**	Figure **5**

G:\Aproject\Union Pacific Railroad\Omaha, NE- UP Shops\Field Activities\Heritage Track Oversight\Data Report to EPA - Apr 2011\Heritage Track - Lead and Arsenic VOCs SVOCs in Soil.xlsx



Project Manager: John Shonfelt
Drawn by: BCO
Date: April 22, 2011

ARCADIS
8725 Rosehill, Suite 350
Lenexa, Kansas 66215
Tel: 913.492.0900
Fax: 913.492.0902

ANALYTICAL RESULTS - LEAD AND ARSENIC

Heritage Track Project - Former Omaha Shops
Omaha, Nebraska

Figure 6

G:\Aproject\Union Pacific Railroad\Omaha, NE- UP Shops\Field Activities\Heritage Track Oversight\Data Report to EPA - Apr 2011\Figures 6 7 and 8 - Heritage Track Sample Results - 22Apr11.xlsx

Notes:

All samples collected 0-1 ft bgs unless otherwise noted

Units are milligrams/kilogram (mg/kg)

SSB-07

VOCs
None detected

SVOCs

Benzo(a)anthracene	0.153
Benzo(a)pyrene	0.124
Benzo(b)fluoranthene	0.116
Benzo(g,h,i)perylene	0.0980
Benzo(k)fluoranthene	0.120
Chrysene	0.172
Fluoranthene	0.313
Ideno(1,2,3-cd)pyrene	0.0822
Phenanthrene	0.237
Pyrene	0.311

DSB-04

6 ft bgs
VOCs
None detected
SVOCs
None detected

10 ft bgs
VOCs

Acetone	0.106
Toluene	0.00202

SVOCs

Fluoranthene	0.0832
Phenanthrene	0.0745
Pyrene	0.0828

22 ft bgs
VOCs
None detected
SVOCs
None detected

DSB-03

6 ft bgs
VOCs
None detected
SVOCs

Acenapthylene	0.0970
Benzo(a)anthracene	0.0924

10 ft bgs
VOCs

Acetone	0.111

SVOCs
None detected

22 ft bgs
VOCs

Acetone	0.0501
Toluene	0.00224

SVOCs
None detected

SSB-12

VOCs

Benzene	0.00231
Ethylbenzene	0.00398
Isopropylbenzene	0.00196
Toluene	0.00644
Xylenes, total	0.0159

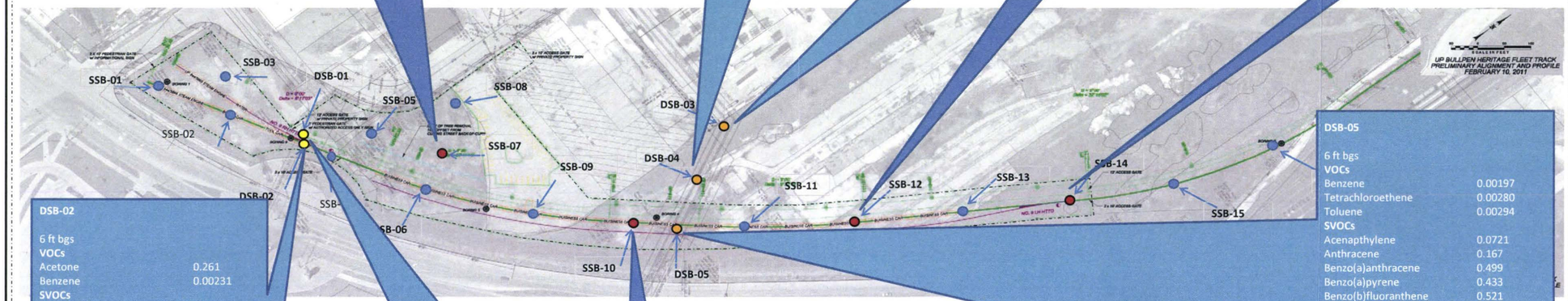
SVOCs

Benzo(a)anthracene	0.0813
Benzo(a)pyrene	0.0911
Benzo(b)fluoranthene	0.0905
Benzo(g,h,i)perylene	0.0705
Chrysene	0.0846
Fluoranthene	0.108
Pyrene	0.132

SSB-14

VOCs
None detected

SVOCs
None detected



DSB-02

6 ft bgs
VOCs

Acetone	0.261
Benzene	0.00231

SVOCs

Acenapthene	16.2
Acenapthylene	10.2
Anthracene	54.4
Benzo(a)anthracene	59.1
Benzo(a)pyrene	32.0
Benzo(b)fluoranthene	33.1
Benzo(g,h,i)perylene	15.0
Benzo(k)fluoranthene	32.1
Carbazole	14.4
Chrysene	50.9
Dibenz(a,h)anthracene	5.88
Dibenzofuran	22.2
Fluoranthene	125
Fluorene	28.6
Ideno (1,2,3-cd)pyrene	15.4
2-Methylnaphthalene	12.2
Naphthalene	16.4
Phenanthrene	170
Pyrene	122
1-Methylnaphthalene	8.86

10 ft bgs
VOCs

Acetone	0.130
Toluene	0.00234

SVOCs
None detected

18 ft bgs
VOCs

Acetone	0.131
Benzene	0.00236

SVOCs

DSB-01

6 ft bgs
VOCs

Acetone	0.0914

SVOCs

Benzo(a)anthracene	0.0993
Benzo(a)pyrene	0.111
Benzo(b)fluoranthene	0.107
Benzo(g,h,i)perylene	0.0838
Benzo(k)fluoranthene	0.0822
Chrysene	0.106
Fluoranthene	0.105
Ideno (1,2,3-cd)pyrene	0.0700
Pyrene	0.122

10 ft bgs
VOCs

Benzene	0.00247
Methylene Chloride	0.0112
Toluene	0.00298

SVOCs
None detected

18 ft bgs
VOCs

Acetone	0.100
Benzene	0.00242
Toluene	0.00301

SSB-10

VOCs
None detected

SVOCs
None detected

DSB-05

6 ft bgs
VOCs

Benzene	0.00197
Tetrachloroethene	0.00280
Toluene	0.00294

SVOCs

Acenapthylene	0.0721
Anthracene	0.167
Benzo(a)anthracene	0.499
Benzo(a)pyrene	0.433
Benzo(b)fluoranthene	0.521
Benzo(g,h,i)perylene	0.358
Benzo(k)fluiranthene	0.324
Chrysene	0.483
Dibenz(a,h)anthracene	0.125
Fluoranthene	0.969
Ideno (1,2,3-cd)pyrene	0.324
Naphthalene	0.0664
Phenanthrene	0.693
Pyrene	0.907

10 ft bgs
VOCs

Acetone	0.0535
Toluene	0.00234

SVOCs

Anthracene	0.0824
Benzo(a)anthracene	0.249
Benzo(a)pyrene	0.227
Benzo(b)fluoranthene	0.214
Benzo(g,h,i)perylene	0.171
Benzo(k)fluoranthene	0.209
Chrysene	0.252
Fluoranthene	0.489
Ideno (1,2,3-cd)pyrene	0.151
Phenanthrene	0.328
Pyrene	0.482

22 ft bgs
VOCs
None detected
SVOCs
None detected

Explanation:

- Surface Sampling Location - Arsenic and Lead (As/Pb) Only
- Surface Sampling Location - As/Pb, VOCs and SVOCs
- Deep Sampling Location (6 ft, 10 ft, 18 ft) - As/Pb, VOCs, and SVOCs
- Deep Sampling Location (6 ft, 10 ft, 22 ft) - As/Pb, VOCs, and SVOCs
- Geotechnical Borings (by others)
- Proposed Project Fenceline

Basemap obtained from Engineering Design & Construction Drawings, HDR, Omaha, Nebraska

Project Manager: John Shonfelt
Drawn by: BCO
Date: April 22, 2011

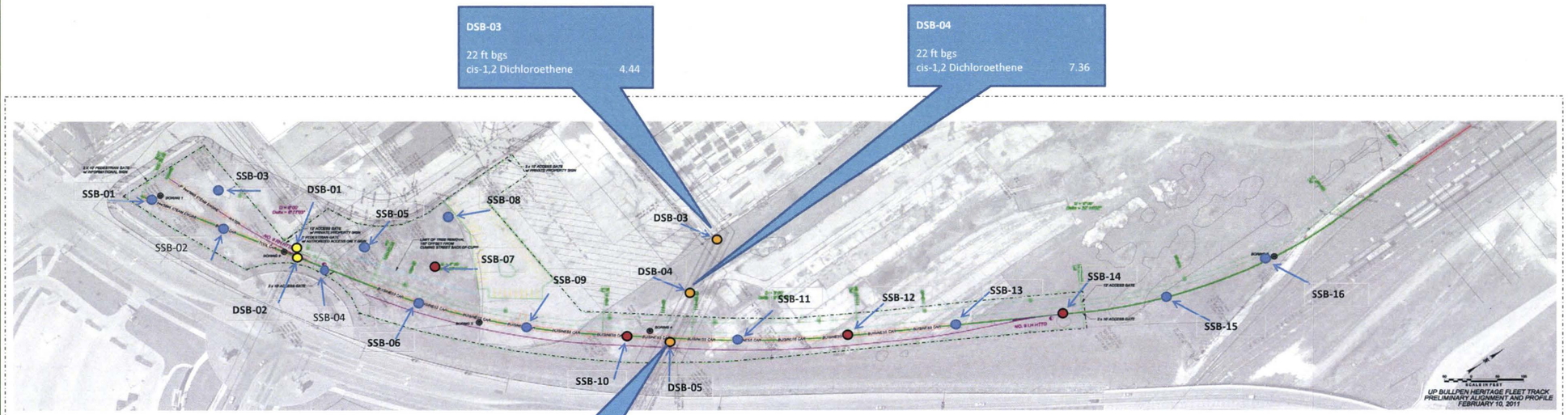
ARCADIS
8725 Rosehill, Suite 350
Lenexa, Kansas 66215
Tel: 913.492.0900
Fax: 913.492.0902

ANALYTICAL RESULTS - VOCs and SVOCs

Heritage Track Project - Former Omaha Shops
Omaha, Nebraska

Figure 7

G:\Aproject\Union Pacific Railroad\Omaha, NE- UP Shops\Field Activities\Heritage Track Oversight\Data Report to EPA - Apr 2011\Figures 6 7 and 8 - Heritage Track Sample Results - 22Apr11.xlsx



DSB-05

22 ft bgs
cis-1,2 Dichloroethene 12.8

Notes:

Sample depth is 22 ft bgs for all groundwater samples

Only detected constituents are presented

Units are micrograms/liter (ug/L)

Cleanup Goal for Groundwater (non-residential exposure, vapor intrusion pathway):
cis-1,2 Dichloroethene 5,694 ug/L

Explanation:

- Surface Sampling Location - Arsenic and Lead (As/Pb) Only
- Surface Sampling Location - As/Pb, VOCs and SVOCs
- Deep Sampling Location (6 ft, 10 ft, 18 ft) - As/Pb, VOCs, and SVOCs (no grounwater encountered at 18 ft)
- Deep Sampling Location (6 ft, 10 ft, 22 ft) - As/Pb, VOCs, and SVOCs (groundwater sample collected at 22 ft)
- Geotechnical Borings (by others)
- Proposed Project Fenceline

Basemap obtained from Engineering Design & Construction Drawings, HDR, Omaha, Nebraska

Project Manager: John Shonfelt
Drawn by: BCO
Date: April 22, 2011

ARCADIS
8725 Rosehill, Suite 350
Lenexa, Kansas 66215
Tel: 913.492.0900
Fax: 913.492.0902

ANALYTICAL RESULTS - GROUNDWATER VOCs

Heritage Track Project - Former Omaha Shops
Omaha, Nebraska

Figure 8

G:\Aproject\Union Pacific Railroad\Omaha, NE- UP Shops\Field Activities\Heritage Track Oversight\Data Report to EPA - Apr 2011\Figures 6 7 and 8 - Heritage Track Sample Results - 22Apr11.xlsx